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Product Market Integration and Household Labor Supply in a Poor Economy: Evidence from Vietnam*

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Abstract: This paper considers how product market integration in a country's primary agricultural export alters the economic activities of men and women in a poor economy. Between 1993 and 1997, Vietnam relaxed its rice export quota and freed internal restrictions on the trade of rice across regions. These reforms contributed to an almost 30 percent increase in the real price of rice. Using a panel of rural Vietnamese communities that spans the period of policy change, we relate the regional and intertemporal variation in the price of rice to changes in the economic activities of children, young adults, and adults by gender. We find that higher rice prices are associated with lower participation in wage work by boys, girls and young adults, and lower participation in household production by adults. Moreover, higher rice prices are associated with less time devoted to household production for all age groups and adults devote more hours to wage work. Finally, with the exception of children, labor market responses to changes in rice prices mostly do not differ statistically for males and females.

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1. Introduction

The new WTO negotiations initiated in Doha focus on the reduction of trade barriers between developed and developing countries. One of their main objectives is a drastic reduction of trade barriers in the agricultural sector that will profoundly influence the economies of very poor countries, such as Vietnam, which had a GNP per capita of $310 in 1997. Most households in poor countries rely on agriculture as their primary source of income, and export commodities such as rice comprise a large proportion of household expenditure. As a result, trade policy-induced changes in prices of export staples will affect the economic activities of households in these countries. However, as Winters (2000) and Dollar and Kraay (2001) point out, little research focuses on the impact of trade policy on well-being in these economies. One of the most important questions is how labor markets adjust to product market integration.[1] This paper uses variation in the domestic price of a country's primary staple and export product to consider the relationship between product market integration and the labor supply of household members in Vietnam.[2]

From 1993 to 1998, the Vietnamese rice market experienced international and national integration. The government of Vietnam had instituted a rice export quota to suppress the domestic price of rice and ensure food security in 1989. The government has since gradually liberalized its export regime by increasing the quota from less than 1 million metric tons in 1992 to 4.5 million in 1998 (see Benjamin and Brandt 2004). In addition, the government also integrated the national rice market in 1997 by lifting internal barriers to rice trade across regions.

[1] Most research on the labor market responses to trade in developing countries focuses on manufacturing sector and relatively wealthy countries such as Mexico where manufacturing is a large employer. Hanson and Harrison (1999) provide a nice survey of these studies. In most of the very poor world, agriculture is the main employer and manufacturing employment is rare.

[2] In addition to participation responses, one could in principle also analyze the implications of product price changes for wages. However, only a small share of people actually work for wages outside the households in Vietnam.

These liberalizations contributed to an almost 30 percent increase in the average domestic price of rice relative to the consumer price index from 1993 to 1998. Moreover, rice price changes vary across communities based on a community's demand and supply of rice as well as a community's integration into national and international markets. In this study, we relate this intertemporal and regional variation in the price of rice to the economic activities of household members.

In Vietnam, 70 percent of households produce rice and expenditures on rice account for 28 percent of the household budget on average.[3] Thus, the observed increases in the price of the primary export staple might, at least in principle, influence labor supply decisions, because households are affected by price increases in both production and consumption. On the consumption side, increases in the price of rice induce both income and substitution effects. If both leisure and rice are normal goods, the resulting negative income effect may increase labor supply while the substitution effect makes leisure relatively cheaper. On the production side, rice price increases might generate a positive income effect through improvements in household income (because of increased profit to rice-producing households and higher agricultural wages paid to day laborers). Moreover, rice price increases might be associated with substitution effects in production if rice price increases raise the marginal value of labor, change the relative return to various types of labor (for example, adult relative to child labor), or shift the relative return to certain types of work (for example, work in agriculture relative to household production). In sum, the dominant role of rice in Vietnamese production and consumption suggests that higher rice prices might potentially exert an important effect on labor supply.

[3]50 percent of rice-producing households sell rice (so that 35 percent of all households sell rice). The remaining rice-producing households produce rice for their own consumption. 7 percent of households consume rice but never buy or sell rice (authors' calculations from the 1992/93 Vietnam Living Standards Survey).

However, given that the theory suggests that the overall effect of rice prices on labor supply is not clear cut, the question ultimately requires an empirical answer.

Previous work suggests that rice price variation has an important impact on the labor supply of children in Vietnam. Edmonds and Pavcnik (2003a) find large declines in child labor associated with rice price increases in rural Vietnam. These declines in child labor are especially large for households that are better endowed with land. Their evidence thus suggests that households substitute higher income associated with rice price increases for income previously earned by children even when the earning opportunities for kids have improved (i.e. the income effect in production dominates the substitution effect in production and the income effect in consumption) and is consistent with the predictions of the models of child labor by Basu and Van (1999), Baland and Robinson (2000), and Ranjan (2001).[4] The same mechanisms that affect the labor supply of children may also impact the labor supply of adults. Of course, adults might adjust their labor supply to rice price changes differently than children because households might face different disutility from adult labor than from child labor. Moreover, adults might experience a greater change in the value of time spent in agriculture (perhaps because adult labor is more complementary with technology or other inputs than child labor). Finally, labor market responses associated with product market integration might differ for men and women because of different gender roles in the household and the market place.

In this paper, we study the labor supply responses of children, young adults, and adults to changes in rice prices following the relaxation of the rice export quota and internal restrictions on trade. Because labor supply responses might differ across genders, we also focus on whether within each of the above categories the labor supplies of males and females react differentially to

[4] Moreover, child labor actually somewhat increases in urban areas where households are exposed to rice prices as consumers and cannot take advantage of higher rice prices as producers or agricultural day laborers. This evidence is also consistent with the importance of income effects.

rice price changes. Our empirical work uses household survey data from the Vietnam Living Standards Survey (VLSS) that spans the period of the rice market liberalization. The first round of the VLSS took place between September 1992 and October 1993, and the second round of the VLSS took place between December 1997 and December 1998 (World Bank 2000). Both rounds are designed to be nationally representative, cross-sectional household surveys. Our analysis focuses on the more than 3,500 households in rural communities that are visited in both rounds of the survey (so that we can examine price changes). This survey enables us to consider the labor supply (participation and time spent) in various categories of work. This includes wage work (i.e. work outside the household in either agriculture or non-agricultural activities), market work within the household (i.e. in either agriculture or non-farm business), and household production (i.e., collecting wood and water, chores, home repair and maintenance, etc.).[5] Focus on work within the household is important in policy analysis of a poor economy such as Vietnam because only a small share of individuals work for wages in the labor market (Rosenzweig 1988). In fact, Smith, Thomas, Frankenberg, Beegle, and Teruel (2002) and Thomas, Beegle, and Frankenberg (2000) convincingly show that studies that abstract from work within households miss an important channel through which families in poor countries adjust to economic shocks.

Our results suggest that rice price increases are associated with lower participation in wage work for children and young adults. For example, the 30 percent increase in rice prices, observed in Vietnam between 1998 and 1993 as measured by VLSS, lowers participation in wage work by 55 percent for girls age 6-15 over their 1993 base, by 28 percent for young women age 16-24, by 20 percent for boys age 6-15, and by 30 percent for young men age 16-24 (albeit

[5] In the VLSS, household production includes cleaning, cooking, washing, shopping, collecting water or wood, caring for animals, and building or maintaining the house, its surroundings, or furniture.

the differences between men and women are not statistically significant). In addition, rice price increases are associated with lower participation in household production for women age 25-64. The decline in participation in household production for adult women is large enough so that they experience a decline in participation in overall work.[6] Moreover, the 30 percent increase in the real price of rice, observed in Vietnam between 1993 and 1998, is associated with approximately 3 fewer hours worked per week for all age groups and genders. Though overall labor supply declines, we also observe changes in how time is spent in different types of work. People of all ages reduce time spent in household production, and adults increase time devoted to wage work. This pattern is consistent with increased specialization of households with economic development and could be due to the fact that higher household income associated with rice price increases enable households to purchase market goods and services previously produced within the household. Finally, with the exception of children, we find little evidence that hours worked of males and females respond differently to rice price changes.

This paper is organized as follows. In section 2 we overview how rice prices can affect labor supply. We describe the data and descriptive statistics in section 3. In section 4 we outline our empirical methodology and present the results in section 5. We summarize our main findings and discuss their implications in section 6.

2. **Theory Motivation**

This section overviews the channels through which changes in product prices following international product market integration can impact an individual's labor supply. An individual's labor supply depends on a person's opportunity cost of time and household income.[7] Changes in rice prices can influence a person's value of time in various types of work and affect

[6] Although the gender difference is not statistically significant, the magnitude of the effect for adult men is basically zero.

[7] See Rosenzweig (1988) and Schultz (1999) for a survey of labor markets in low-income countries.

income earned by an individual and by other household members. In the next two subsections, we first focus on the general mechanism through which relative product prices influence an individual's labor supply. We then consider why these effects might differ by gender and age.

2.1 Substitution Effects of Changes in Rice Prices

Let us first focus on the mechanisms through which increases in the rice prices can affect an individual's opportunity cost of time. First, from the household's perspective, the value of a person's time in an activity is a relative price rather than an absolute price. Thus, rice price changes affect the relative value of a person's leisure through changing the cost of one of the most important goods in the household's consumption. In particular, as the consumption of rice becomes relatively more expensive than the consumption of leisure, we expect an individual to substitute toward more leisure (i.e. less work). This is the substitution effect in consumption.

Second, higher rice price might increase the labor demand in agriculture and increase the value of labor's marginal product. Rice price increases may shift labor demand up, because the household earns greater income per unit rice produced. Thus, equilibrium wages are higher, and there are incentives for individuals to increase labor supply. This can be thought of as a substitution effect in production. Moreover, the relative value of time may vary across different types of work because of local market or household attributes. For example, rice price increases may shift the value of time in wage work relative to work in agriculture within the household. Alternatively, rice price increases might not change the value of time in wage work relative to work in agriculture within the household, but might affect the relative value of time in the household production of non-traded goods such as cleaning, gathering of fuelwood, fetching water, feeding animals, etc. Hence, rice price movements may shift an individual's labor supply in its overall level, and given total labor supply, rice price movements may affect an individual's

labor supply differentially across various types of work. Finally, rice price increases might also affect the relative value of work across various types of labor (for example, child and adult labor). Because labor supply decisions are not made in isolation, the effect of rice prices on an individual's labor supply may thus also depend on how the value of an individual's time changes relative to the household's value of time for other household members.

A priori, it is not clear which of these substitution effects dominates. Overall, the substitution effects of rice price changes in production and consumption yield an ambiguous effect on an individual's labor supply and might also affect participation in different types of work differentially.

2.2 Income Effect of Changes in Rice Prices

In addition to affecting the opportunity cost of time, increases in rice prices also influence an individual's labor supply through changes in household income. Changes in rice prices can affect household income through production and consumption. First, on the production side, as discussed above rice prices may increase the value of labor's marginal product in rice production. This could lead to additional wage income from household members that work as agricultural day laborers. Moreover, 70 percent of Vietnamese households produce rice. Households that hold land will thus capture additional profits from higher rice prices. Second, most Vietnamese households not only produce rice, but rice is the primary staple in the Vietnamese diet. In fact, household expenditures on rice account on average for 28 percent of the overall household budget and 44 percent of the expenditure on food. As a result, higher rice prices will also have a negative income effect through consumption. Thus, the overall effect of higher rice prices on household income is ambiguous.

There are several mechanisms through which income can affect labor supply. Most obviously, leisure may be a normal good. Second, liquidity constraints may prevent households from hiring permanent labor, changing household composition, or renting agricultural land. Increases in income might relax this liquidity constraint and thereby affect labor supply. Third, higher household income may induce households to buy market substitutes for goods previously produced within the household (perhaps inefficiently because of liquidity constraints). As with changes in landholdings or hired labor, this may influence labor supply. In sum, if rice price increases are associated with higher household income, we would expect labor supply to decline.

Overall, the above discussion on income effects suggests that the association between changes in rice prices and an individual's labor supply is not clear cut. Further, in conjunction with the conclusions in section 2.1, it is clear that the question regarding the impact of changes in rice prices on an individual's labor supply can be best answered through empirical work. Moreover, the interconnectedness of the mechanisms through which income influences supply with the value of time discussion above makes identification of the channels through which rice price changes influence an individual's labor supply very difficult. Thus, the focus of the rest of the paper is on the reduced form relationship between rice price movements and labor supply.

2.3 Gender and Age Differences in Labor Response to Rice Price Changes

The above discussion abstracts from the possibility that the labor supply response to increases in rice prices after market integration might vary across men and women. Previous work on female labor supply in developing world surveyed in Schultz (1999) suggests that female labor supply might respond differentially to shocks than male labor supply. Gender differences in the effect of rice price increases could arise for several reasons. First, the household may perceive differences in the disutility of work for men and women. This may

reflect individual preferences or tastes of the household's decision maker. For example, households may place less disutility on the labor supply of women. Second, sex-typing of tasks may be important in labor supply decisions, so that a given gender might predominately perform certain jobs. In Vietnam, males and females have similar participation rates in agriculture, but males are more likely to work outside of the household for wages and females are more likely to be involved in the production of non-traded goods within the household. Even within agricultural tasks, there are differences (Desai 2000). Males tend to be stronger and are thereby more likely to perform physically intensive tasks. Females tend to spend relatively more time in livestock care and maintenance. Sex-typing may reflect individual preferences, comparative advantage, gender discrimination, or cultural norms. Regardless of the reason for sex-typing, the value of time can be affected by changes in rice prices differently by gender. Hence, men and women may experience different changes in their labor supply. One could similarly argue that rice price changes might differentially impact the labor supply of people of different ages, in particular children versus adults. As a result, our empirical work allows the relationship between changes in rice prices and an individual's labor supply to vary across the gender and age categories.

3. Data Description

We examine the relationship between product prices in the rice sector and the economic activities of household members using two rounds of the VLSS, a multi-purpose household survey, that span the period of the rice market liberalization. The VLSS includes questions on household composition, the labor activities of adults and children, education, expenditure, land holdings, and agricultural activities. Concurrent with the household survey, an enumerator ventured to a local market to collect prices on 38 different kinds of food at the commune

(community) level. We rely on the household survey for labor supply data and the community-level price survey for rice price variation.

The first round of the VLSS was conducted between September 1992 and October 1993. The second round of the VLSS revisited 147 communes from the first round between December 1997 and December 1998 (all but 2 percent of the first round sample was targeted for the second round). In our analysis, we focus on households in the 115 *rural* communes that are visited in both rounds of the VLSS. We refer to these revisited communes as panel communes. Table 1 reports basic summary statistics for the rural sample. In the panel communes during the second round of the VLSS, the survey teams were instructed to re-interview the same households interviewed in the first round of the survey.[8] If a household was not found, the missing household was replaced by a randomly selected household from the original enumeration list. Thus, our analysis is not restricted to households that are interviewed in both rounds of the survey. Hence, selective attrition is not an issue for our analysis that is based on commune-level variation in rice prices, because the sample is random within each panel commune. Of course, the reader should be cautioned that our results are not nationally representative by statistical design, though in practice they may generalize. A second major caution in interpreting the empirical work of this study is that any movements in labor supply affected by rice prices that result in the physical movement of a household or an individual will be missed. Edmonds and Turk (2004) consider how large a problem children missing for work might be in VLSS panel households. They find that at most 36 out of 6003 children who are 0-10 in the first round of the VLSS may be missing from the second round of the VLSS for work reasons. Thus, at least for

[8] Mobility restrictions in Vietnam are rather severe, so 90 percent of the households in the first round of the VLSS that were targeted in the second round of the VLSS were recaptured. Glewwe and Nguyen (2004) compare the household panel component of the dataset to the nationally representative part and conclude that panel households appear similar to the non-panel households.

children, missed changes in labor supply owing to migration are not likely to be significantly distorting our results for the population means.

In this paper we relate changes in the price of rice to changes in the labor supply of children, young adults, and adults by gender. Let us first overview the rice price changes that occurred between 1993 and 1998. The sixth row in table 1 reports the consumer price of a kilogram of ordinary rice in 1993 and 1998 from the community-level price survey.[9] We deflate the price of rice with the monthly consumer price index so that all prices are in thousands of 1998 (January) Dong. One U.S. dollar corresponds to approximately 14,000 Dong in 1998.[10] The average domestic price of rice increased by 28 percent relative to the rise in the consumer price index (Table 1).[11] Figure 1 plots the real rice price data for the 147 panel communes that are revisited in both rounds of the survey. The horizontal axis is the real price of rice in a commune in 1993, and the vertical axis is the real price of rice in a commune in 1998. The 45-degree line is also pictured. 95 percent of the panel communes in the VLSS experienced an increase in the real price of rice between 1993 and 1998. The variation in rice price changes across communities is substantial. Our study focuses on the 115 rural, panel communes which are a subset of the panel communes pictured in Figure 1. As in figure 1, there is considerable

[9] 6 communes do not report the price in at least one of the survey rounds. We impute the rice price in these communes. Based on the unit value of rice purchased by households reported in the VLSS, we calculate the mean unit value of a kg of rice for a commune in a given survey year. We regress the price of rice reported in the price survey on the third order polynomial of the mean unit value of rice in a commune. We replace the missing price data with the predicted value of commune price based on this regression.

[10] The price deflator does not vary by region, because we do not want the deflator to drive the variation in rice prices.

[11] We have also compared the prices reported in the commune questionnaire with the average commune price based on unit values of purchased rice from the household survey. The correlation between prices collected in the commune-level survey and average commune price based on unit prices from the household survey in levels is .68. A third available estimate of aggregate rice price movements is the National Statistical Office's rice price index computed in the context of the overall consumer price index. The sampling frame of the consumer price index differs from the VLSS, and the comparability of the two estimates is not well understood. Nevertheless, between 1992 and 1998, real rice prices increase by 27 percent according to the official rice price index.

variation in price changes in these rural panel communes. On average, the relative price of rice increases by 31 percent in the rural panel communes that we study (Table 1).

During the time of our sample, Vietnam experienced national and international market integration. Although it is impossible to disentangle the effects of changes in rice export quotas on prices from other factors that could affect prices, two pieces of evidence suggest that Vietnam's integration into international markets played an important role. First, in the absence of international integration and unobserved demand and supply shocks, national market integration alone would likely lead to convergence of prices across regions with prices in rice surplus regions increasing and the prices in rice deficit regions declining. However, the prices increase dramatically in all regions during these two periods. Second, the South supplies most of the Vietnamese rice exports, and while the rice prices increased by 23 percent in the North, they increased by 35 percent in the South. The lack of national convergence and larger price changes in the South suggest an important role for international market integration vis-à-vis the observed changes in rice prices. Edmonds and Pavcnik (2003a) and Benjamin and Brandt (2004) provide additional support for this claim.

The VLSS also contains questions on an individual's participation and hours worked in a number of activities. We use the information on participation to create several indicators of labor supply participation within and outside the household:

- work in agriculture outside the household,
- work in nonagricultural activities outside the household,
- work in household production (in the VLSS data this includes cleaning, cooking, washing, shopping, collecting water or wood, caring for animals, and building or maintaining the house, its surroundings, or furniture),

- work in agriculture within the household,
- work for household nonfarm enterprise (henceforth household enterprise).[12]

All of the above participation categories are mutually exclusive. However, an individual can participate in more than one of these activities. We aggregate the above participation categories into several broader categories of participation:

- work/any work: this variable is one if a person participates in at least one of the above activities and zero otherwise (note that this also includes participation in household production),
- wage work (i.e. work outside the household): includes participation in work in agriculture outside the household and work in nonagricultural activity outside the household,
- work within the household: includes work in agriculture within the household, work for household enterprise, work in household production,
- market work: includes participation in work for wages, work in agriculture within the household, and work in household enterprise,
- market work within the household: includes work in agriculture within the household and work for household enterprise (i.e. work within the household less work in household production).

Note that most of the above groups are not mutually exclusive. In addition, we also aggregate some of the original participation indicators to obtain indicators for an individual's participation by sector of employment:

- work in agriculture: includes participation in work in agriculture outside and within the household,

[12] Work within the household refers to work in an individual's residence. This is in contrast to work outside the household for which the worker receives cash or in-kind remuneration (labeled wage work).

- work in nonagricultural activities: includes work in nonagricultural activities outside the household and work in household enterprise.

Finally, in addition to participation variables, we consider whether a person is unemployed. A person is unemployed in the VLSS data if the person has not worked in the last 7 days (either for wages or within the household) but reports looking for paid work in the last 7 days.

The VLSS not only provides information on participation in various categories of work, but also hours of work spent in these activities. As a result, we create variables that capture hours worked in all of the above work categories. Unfortunately, the VLSS questionnaire changed how it collects information on hours worked in household agriculture between survey rounds (participation questions and hours in all other types of work are identical between rounds of the VLSS). The 1993 questionnaire asks how many hours on average the respondent works in self-employed agriculture in the last 7 days and (separately) as an agricultural worker on another household's farm. The 1998 questionnaire asks the identical question for work in agriculture outside of the respondent's own household. However, no such question is asked for self-employed agricultural work. Instead, the 1998 questionnaire disaggregates the within the household agricultural work into 4 different tasks (planting and harvesting, livestock maintenance, processing, marketing) and 3 different categories of agricultural production (crop and fruit production, aquatic cultivation, and forestry), asking hours worked in peak and non-peak seasons over the last twelve months in each of these categories.

This change in the questionnaire might lead to substantive differences in reporting of hours worked within the household agriculture between the two survey years. First, there is no reason to expect labor supply in the last 7 days to be representative of usual hours worked in any given season. Second, the context of a question affects both respondent's interpretation of the

question and the types of memories recalled in response to the question. Thus, the disaggregated 1998 question is likely to trigger different recollections by the respondent to estimate hours worked (see Sudman, Bradburn, and Schwartz 1996). Third, in the 1993 question the respondent is left to determine what agricultural work is, but the 1998 questionnaire details all of the types of activities that it considers agricultural. Hence, it may actually encompass different activities (see Schwartz and Sudman 1996).

If these biases in the measurement of hours worked in household agriculture are correlated with the changes in the price of rice, our empirical findings that rely on hours worked in agriculture might be biased. One can imagine a scenario where this is the case. For example, Benjamin and Brandt (2003) document that rice price increases are largest in areas that produce a large quantity of rice. Moreover, the bias in the measurement of hours worked in agriculture introduced by the changes in the questionnaire are likely to be most substantive in these areas as well, because the biases might affect the largest agricultural households the most.[13] As a result, all findings based on variables that include hours worked in household agriculture (i.e. total hours worked in agriculture, market work, market work within the household, and total hours worked) should be interpreted with caution. However, note that none of the participation questions or other hours worked questions were changed between the two survey rounds. As a result, this change in the questionnaire does not affect hours worked in wage work (in agriculture, in nonagricultural activities), household production, and household enterprise, and none of our participation variables. Given that many of the variables of interest are not affected, we continue to pursue this project. However, one should be cautious when interpreting the

[13] It seems reasonable to consider that the change in the questionnaire would not affect the reported hours worked in agriculture for households that are not involved in agriculture at all. Moreover, given that the new questions ask details about many tasks, the survey change might potentially affect the individual's answers in a large agricultural household that perform many agricultural tasks more than in a small agricultural household that only focuses on one agricultural activity.

results based on variables that include hours worked in agriculture (i.e. total hours worked, hours worked in agriculture, hours worked in market work, and hours worked in market work within the household).

Prior to exploring the relationship between participation in economic activities and rice prices, we consider descriptive statistics on the economic activities of males and females in Vietnam in both rounds of the VLSS. Table 2 reports the summary statistics for economic activities of women and men ages 6-15, 16-24, and 25-64 in 1993 and 1998 living in rural areas. The top panel of table 2 reports the economic activities for rural females ages 6-15, 16-24, and 25-64 in 1993 and 1998. The bottom panel presents this information for rural males. Note that an individual can participate both in within the household work and work for wages at the same time. As a result, the share of individuals who work within the household and the share who work for wages does not need to add up to overall female participation rates. Similar logic applies for aggregations such as 'work for wages' and 'within the household work'. Moreover, the hours worked variable for each work category is conditional on participation in that particular work category. Because people who work, do not participate in all work categories, the hours worked variables also do not add up to total hours worked.

Let us first consider labor market participation for women. Several interesting facts appear. First, in all age groups, the majority of women report participating in some kind of work. In 1993, the participation rates in overall/any work range from 69 percent for girls ages 6-15, 93 percent for women ages 16-24, and 97 percent for women ages 25-64. Few women participate in wage work (in 1993, participation rates range from 2.2 to 14.1 percent in various age groups), and most women participate in work within the household (participation rates range from 69 to 96 percent in 1993). These large participation rates in work within the household

stem from participation in agricultural activities and household production. For example, in 1993, 70 percent of women age 25-64 work in agriculture within the household, 17 percent work in household enterprise, and 94 percent work in household production.

Between 1993 and 1998, women experience several changes in their work participation. First, girls ages 6-15 experience a significant decline in overall participation rates. This occurs despite a policy environment where state fiscal resources are declining. Little new policy is directed specifically at child labor (Edmonds and Turk 2004) and direct schooling costs appear to be increasing (Government of Vietnam – Donor Working Group, 2000). The overall participation rates for other age groups do not change substantively. Even though the overall participation rates do not change much for women 16-24 and 25-64, women could be switching their participation among different economic activities or expanding the number of activities in which women participate. Consequently, the table further separates participation into wage work and work within the household. The decline in the overall participation for girls ages 6-15 reflects a decline in the participation in wage work and work within the household (mostly due to lower participation in household agriculture). Moreover, women ages 16-24 and 25-65 do not experience significant changes in wage work and work within the household. However, the share of women ages 25-64 that participate in agricultural work within a household increases by 7 percentage points from 69.7 to 76.8. This suggests that women who participate in household production or household enterprise now also engage in household agriculture. Finally, the table considers participation in market work (defined as wage work, work in household agriculture, or household enterprise). Participation in market work declines for girls ages 6-15 (due mostly to declines in participation in household agriculture), does not change for women ages 16-24, and increases for women ages 25-64 (due mostly to increased participation in household agriculture).

Between 1993 and 1998, females also change the time they allocate to various types of work. Table 2 also reports hours spent in various types of work for women of different ages conditional on participating in each activity. Girls ages 6-15 not only experience a decline in participation in labor force, but girls that continue to work now reduce total hours worked. Women ages 16-24 also reduce the total hours worked despite no change in participation rates. The declines in hours worked by these younger women reflect a decline in hours worked within the household (especially in household production). In contrast, women ages 25-64 increase the number of hours spent working. This reflects an increase in time allocated to wage work and work within the household (especially increases in time allocated to household agriculture). Interestingly, women of all ages devote less time to household production in 1998 than in 1993 and more time to wage work in nonagricultural activities and household enterprise.

In sum, preliminary statistics suggest that between 1993 and 1998 girls ages 6-15 dramatically reduced their labor supply and that girls who stay in the labor market work significantly fewer hours. Although the labor supply of women ages 16-24 has not changed much, those that work now work fewer hours. While women ages 25-64 have not changed their overall participation rates, many of them now perform agricultural tasks in addition to household production. This has led to reduced hours allocated to household production and an increase in the time allocated to agriculture (in both wage work and within the household). Overall, total hours worked by women ages 25-64 has increased. Beneath these changes in hours worked are substantive changes in the value of female time in various activities. Computing the value of female time in various activities, most of which are not traded, is a daunting task. However, the change observed in wages for women that work for wages are suggestive. Between 1993 and 1998, real wages for women that participate in wage work increase by approximately 65 percent

in the VLSS data. If the value of female time increases similarly in other types of market work but not in household production, this increased value of time may be behind the shift in female labor supply away from household production.

We next consider changes in male labor supply. The bottom panel of table 2 reports the labor supply participation rates for rural males in 1993 and 1998. Before highlighting the changes across the two years, we first compare the differences in the economic activities of Vietnamese males and females. We focus mostly on data from 1993 (unless the situation has changed in 1998). A comparison of the top and bottom of table 2 reveals several interesting facts about the Vietnamese labor market. First, males and females of various age groups do not differ substantively in the overall participation rates in any kind of work with the exception of girls ages 6-15 being more likely to work than boys of the same age. Second, with the exception of work for wages for ages 6-15, men are more likely than women to work for wages and less likely to work within the household. The latter mostly reflects the lower participation rate of men in household production. Third, the participation rates in agriculture within the household do not differ much between males and females in 1993. However, women ages 16-24 and 25-64 are about 6 to 7 percentage points more likely to work in household agriculture than men in the respective age categories in 1998. These differences mostly reflect a decline in participation of men ages 16-24 in household agriculture and an increase in participation of women ages 25-64 in household agriculture. In addition, men ages 16-24 and 25-64 are more likely to work in agriculture for wages outside the household than women in the respective age groups. Overall, men ages 25-64 are more likely to participate in market work than women ages 25-64. Finally, males work fewer hours than females, mainly because females devote more time to work within the household.

Males experience some similar changes in participation rates as females between 1993 and 1998. Boys ages 6-15 experience a decline in overall participation between 1993 and 1998 due to a decline in participation in all activities other than household production. This decline is predominately driven by a decline in participation in household agriculture. Young men ages 16-24 also experience a decline in overall participation stemming from declines in participation in all activities other than household production (the participation increases by 5 percentage points) and wage work (mostly due to increased participation in nonagricultural activities). However, men ages 25-64 do not change their overall participation rates. Unlike women ages 25-64, men do not appear to increase their participation in household agriculture significantly. However, men 25-64 do increase their participation in wage work in nonagricultural activities. Overall, participation in market work increases slightly for men ages 25-64 and declines drastically for boys and men ages 16-24. These declines in market work for boys and men ages 16-24 are mostly driven by declines in participation in household agriculture. Moreover, total hours worked conditional on working declines for males ages 6-15 and 16-24 (mostly due to declines in hours worked in household agriculture and household production). However, total hours worked conditional on working increases for men ages 25-64. For women ages 25-64 the increase in hours worked occurs due to more time spent in household agriculture (there is also a large increase for women in hours in nonagricultural wage work, but these increases are concentrated among only 5.6 percent of the women). For men ages 25-64, most of this increase occurs due to an increase in hours spent in wage work in nonagricultural activities and household enterprise. As with women, there is suggestive evidence in the VLSS that higher wages may lurk behind these changes in labor supply. Men that work for wages earn 70 percent higher real wages in 1998 than they earned in 1993. It seems likely that the value of time in nonagricultural

activities (comprising of wage work in nonagricultural activities and work for household enterprise) should be correlated with wage rates.

Overall, the gender gap in hours worked for adults increased from 4 hours in 1993 to 6 hours in 1998. Behind these changes are similar percentage increases in wage rates, although men experience a slightly larger percentage increase in wages. In the next section, we explore whether these observed trends in labor supply are related to changes in rice prices between 1993 and 1998. Because of problems of selection and endogeneity in wages, we do not try to separately identify the effect of rice price increases on labor supply that work through changes in the relative value of time (through substitution effects in production and consumption) and changes in household income (on either production or consumption side).[14]

4. Empirical Framework

In our empirical work, we relate changes in participation and hours worked in various economic activities to changes in rice prices across communities and time. We cannot attribute all variation in the price of rice to relaxation of internal restrictions on trade and the easing of the rice export quota. However, the observed rice price movements resemble the price movements that would arise in future product market integration and thus provide an excellent setting to study the effect of product market integration on household labor supply.

In order to interpret the association between rice prices and participation in various activities as causal, we need to account for several factors that are associated with rice prices and labor supply that have nothing to do with the causal effect of rice prices on the labor supply.

[14] The selection problem is that we only observe wages (and therefore the value of time) and hours of work outside of the household when the return to working outside of the household is greater than or equal to the return to working inside the household. It seems likely that rice prices changes may affect this relative return to work outside of the household. The endogeneity problem is that hours worked and observed wages are jointly determined. This problem is especially acute in cases like the present where wages must be computed by dividing total earnings by hours worked.

First, we control for unobserved economy-wide time shocks that could affect the probability a person works and rice prices with a year indicator that is one if the survey year is 1997/98 (1992/93 is the omitted year). Second, the economic activities and rice prices could be affected by the season during which the interview took place. We control for seasonal variation by including season indicators, an indicator for whether the interview took place at a rice harvest, and an indicator for whether an interview took place at rice planting time. Third, the economic activities of households and rice prices might vary across communes because communes differ in the availability of schooling, labor market conditions, land and resource endowments, and integration into the Vietnamese economy. These unobserved commune characteristics would bias our estimate of the effect of rice prices on participation in economic activities. We address this problem by exploiting the panel nature of our data and including commune fixed effects in our regressions. Commune fixed effects control for time-invariant commune characteristics.[15] If all commune characteristics that affect rice prices and independently affect participation in economic activities are time invariant, our estimates of the effect of rice prices on economic activities are identified.

However, this is potentially a strong assumption. Unobserved time-varying commune-specific factors that affect rice prices could also independently affect participation in economic activities. As a result, we also consider several potential sources of time-varying commune-specific shocks to rice prices and economic activities. First, rice price changes vary differentially across Vietnamese regions (see section 3). At the same time, different regions might have implemented differential policy changes and infrastructure improvements between 1993 and 1998. Or, labor mobility across regions might be limited, which could lead to variation in the

[15] Within communities, there may be unobserved heterogeneity in households that is correlated with both rice prices and labor market participation. Since we identify the effect of rice prices on labor market participation with community*time variation in rice prices, we do not believe that this household heterogeneity generates bias.

changes in the returns to schooling across regions. These unobserved region-specific time-varying shocks could result in spurious correlation between rice prices and economic activities. In our regressions, we control for them by interacting each region indicator with a year indicator.[16] Second, Vietnamese communes differ in their accessibility. If more accessible communes are better integrated into international and national rice markets, these communes might undergo bigger rice price changes. Similarly, accessibility might be associated with a range of time-varying factors affecting labor supply. For example, more accessible communes are likely to have better transportation and thus better access to schools or workplace. The VLSS provides information on whether regular transportation is provided to a commune and whether the road to commune is paved. Based on this information, we create two indicator variables for a communes' accessibility and interact them with the year indicator. Inclusion of these two interactions in our empirical framework allows for a different change in economic activities in accessible communes. Finally, Edmonds and Pavcnik (2003b) consider some additional commune-specific factors such as high yield seed use, droughts, pests, infrastructure changes and other shocks that could simultaneously affect changes in rice prices and changes in participation. We do not include them in our current analysis because previous research found that these factors are not substantively correlated with price changes. Moreover, we only have data on these factors for a subset of households, so their inclusion would limit the sample.

We estimate the relationship between the economic activities and rice prices using a linear regression framework. For a person *j* in commune *i* at time *t*, we estimate:

$$(1) \qquad y_{ijt} = \beta_0 + \beta_1 RP_{it} + \beta_2 RP_{it} * Male_j + \varphi X_{jt} + \alpha_1 C_{it} + \alpha_2 T_t + \alpha_3 A_i * T_t + \lambda_i + \varepsilon_{ijt}.$$

y_{ijt} is a measure of the economic activities of person *j* in commune *i* at time *t*. In the empirical work below, this will be hours worked in a particular type of activity or a dummy variable

[16] There are 4 to 35 sampled communes per region (the mean and the median are both 25 communes per region).

indicating person *j*'s participation in an activity. When y_{ijt} is a dummy variable, (1) is a linear probability model. RP_{it} is the natural logarithm of the real price of a kilogram of ordinary rice in commune *i* at time *t*, and $RP_{it}*Male_j$ is the interaction of the natural logarithm of the rice price with an indicator for whether person *j* is a man. Vector X_{jt} captures personal characteristics. Labor supply might differ across people because of differences in gender, age, and education. We control for gender and age differences in X_{jt} using a third order polynomial in a person's age, a dummy variable for gender (male=1, female=0), and a vector of interactions of the gender dummy variable with all of the terms of the age polynomial. We control for education by inclusion of a variable that reflects the number of completed years of schooling. We also interact education with the gender dummy variable in order to allow the association between education and labor supply to vary by gender. T_t is a year indicator, λ_i is the commune fixed effect, and C_{it} is a vector of controls for commune-specific seasonal variation. Since we estimate equation (1) jointly for men and women, we interact all of the controls for commune-specific seasonal variation (C_{it}) and the year indicator with the gender dummy variable to allow these variables to have a differential impact on men and women. A_i is a vector of time-invariant community characteristics such as region indicators and commune accessibility indicators that we interact with time to allow different time trends in labor supply associated with these community traits.[17] We also allow for different time trends with accessibility for men and women by interacting $A_i * T$ with the gender dummy variable. Finally, we estimate (1) separately for people ages 6-15, 16-24, and 25-64. This allows for the effects of rice prices (and all other control variables) to differ across people of different age groups (for example, children vs. adults). Finally, in all

[17] Note that we do not have to include commune accessibility and region indicators on their own because commune fixed effect already captures time-invariant commune characteristics such as the region in which the commune is located and commune's accessibility.

regressions, the standard errors are corrected for heteroskedasticity and clustering at the commune/survey round level.

The coefficient on rice price β_1 indicates the effect of rice prices on female participation (or hours worked) in various activities. The coefficient on the interaction of rice prices and male indicator β_2 indicates an additional association between rice prices (if any) and the participation (or hours worked) of men in the activity. Thus, the total observed effect of rice prices on men is the sum of the coefficient on rice prices and the coefficient on the interaction between rice prices and the male dummy, $\beta_1 + \beta_2$.

Finally, section 3 indicated that in Vietnam people participate in a wide range of work. In addition, people can participate in more than one activity. This could occur for several reasons. First, if the value of time is equalized across activities, the choice of which activity to participate in is arbitrary. Second, individuals that desire to work for wages could face binding constraints on the availability wage work because of efficiency wage related issues. Third, businesses and households might face rationing constraints on the pool of workers they can hire, especially when mobility restrictions limit the free flow of labor as in Vietnam. This could preclude households from hiring labor to perform activities within the household. As a result, household members might engage in work within the household in addition to a job outside the household and might also perform multiple tasks within the household. Fourth, Paxson and Mammen (2002) emphasize that in some cultures there is a stigma associated with female work outside of the household or with male work in some types of activities within the household. In this case, then, individuals may have to perform multiple tasks where their productivity differs across tasks.

Our empirical work thus not only considers the relationship between rice prices and overall work participation, but also explores the relationship between rice prices and various subcategories of work. In particular, we consider participation and hours worked in different types of work as a dependent variable: wage work, work within the household, market work within the household, household production, market work, any work. In addition we consider participation and hours worked in various sectors of employment as dependent variable: agriculture (wage work, within the household, overall), and nonagricultural activities (wage work, within the household, overall).

5. Results

In this section we overview the results from estimating equation (1). In subsection 5.1 we explore the relationship between participation in various forms of work and rice prices. In subsection 5.2, we consider the relationship between hours worked in various activities and rice prices.

5.1 Participation

Table 3 presents the estimation results for participation in various types of work. The dependent variable in question (wage work, work within the household, market work within the household, household production, market work, any work) is specified on top of each column. The table has three panels that present results from 3 distinct sets of regressions. The top panel reports the coefficient on rice prices and the coefficient on the interaction of rice prices with a male indicator from regressions that estimate (1) for people ages 6-15. The middle panel provides the regression results for people ages 16-24, and the bottom panel provides the regression results for people ages 25-64. For example, the results reported in column 1 in the top panel are for the regression of participation in wage work for kids ages 6-15.

Several interesting findings emerge. First, higher rice prices are associated with lower participation in wage work for people ages 6-15 and 16-24 (column 1). The magnitude of the effect of rice prices on wage work is especially large for young adults ages 16-24. For example, the 30 percent increase in the price of rice is associated with a 4 percentage point decline in participation, which amounts to a 28 percent decline in the probability a woman ages 16-24 works for a wage from her 1993 base. The 30 percent increase in the price of rice is associated with 6 percentage point decline in the probability that a man ages 16-24 works for a wage. This corresponds to a 30 percent decline in the probability that a man ages 16-24 works for a wage from his 1993 base. Interestingly, this age group experiences the largest increase in school attendance in the VLSS (Nguyen 2002). Moreover, higher rice prices are not associated with statistically significant changes in participation in wage work for older adults.

Second, column 2 of table 3 considers participation in work within the household. Higher rice prices are not associated with changes in participation in work within the household for girls, but are associated with increases in participation for boys ages 6-15. This increase in work within the household for boys appears to be driven by an increase in participation in household production rather than an increase in market work within the household (columns 3 and 4). Moreover, there is no association between rice prices and participation in work within the household for adults ages 16-24. However, adult women ages 25-64 experience a decline in work within the household (bottom panel, column 2). This decline is mostly driven by the decline in adult female participation in household production associated with rice price increases (column 4).

Overall, column 5 suggests that rice price increases are not associated with changes in market work for children, but are associated with declines in participation in market work for

young adults ages 16-24. Moreover, rice price increases are not associated with changes in participation in market work for adults ages 25-64. Column 6 considers participation in any work. While rice prices are not associated with changes in participation in any work for girls, boys experience an increase in participation in any work. There is no association between rice price changes and participation in any work for young adults. However, adults (especially adult women) experience a decline in participation in any type of work.[18] In magnitude, this decline in female participation is small. It corresponds to approximately a 1 percent change in the probability a woman works from her 1993 base after the 30 percent increase in the price of rice. The low magnitude reflects the fact that the reduction in participation in household production is mitigated by an increase in participation in wage work (albeit this increase is not statistically significant). Finally, note that most of the coefficients on the interaction of rice prices with male indicator in table 4 are not statistically significant at a 10 percent level. As noted above, we find gender differences mostly for children (in work within the household and any work) and in work within the household for the 25-64 age group. This suggests that rice prices in general do not exert statistically differential impact on the work participation of males and females over the age of 15 in Vietnam.

So far, we have considered the relationship between rice price increases and wage work, work within the household (and its components), and market work. However, rice prices might also affect the sector of employment. As a result, we next consider whether rice price changes are associated with changes in participation in agricultural and nonagricultural activities.

In particular, rice prices increases might be associated with increased employment in agriculture by increasing the value of labor's marginal product in agriculture or more generally

[18] Although the gender difference is not statistically significant, the magnitude of the effect for adult men is basically zero.

by increased growth in the agricultural sector. Agriculture is the dominant sector in the Vietnamese economy. In 1993, 72 percent of rural men 25-64 participate in agriculture as compared to 30 percent of men participating in nonagricultural activities. The question obviously arises whether there is a scope for increases in agricultural participation. Vietnamese farms are generally small (Van de Walle 2001), and there may be limited opportunity for increasing employment in agriculture even with increasing potential agricultural income. Moreover, rice price increases might potentially be associated with increased employment opportunities outside agriculture. For example, additional household income from rice price increases may lead to greater household demand for goods produced outside of the household in either agricultural or nonagricultural sector. Similarly, intensified trade in rice with the rest of the world and across Vietnamese regions after product market integration might result in greater demand for employment in nonagricultural activities such as rice processing, distribution, or other activities that support agriculture.

Table 4 looks at the participation by sector of employment (agricultural and nonagricultural activities). For each sector, we consider wage work, work within the household, and overall participation in that sector. In most cases, the data reveal no statistically significant association between rice prices and participation by sector. There are a few exceptions. In particular, rice price increases are associated with declines in participation in wage work in agriculture for children and young adults. Although this relationship is not statistically different for males and females, the magnitude of the effect is slightly lower for males in both categories. Interestingly, rice price increases are associated with increases in participation in wage work in nonagricultural activities for adults. However, overall, we find no statistically significant

relationship between rice price increases and participation in agricultural and nonagricultural activities.[19]

In sum, higher rice prices are associated with a decline in participation in work for wages for children (ages 6-15) and young adults (ages 16-24). These two groups also experience a decline in participation in wage work in agriculture with rice price increases. These declines in participation in work for wages may reflect the fact that households use the additional income associated with rice price increases to replace wages previously earned by children as in Edmonds and Pavcnik (2003a). Interestingly, boys experience an increase in participation in work within the household (because of increases in participation in household production). Note that table 2 suggests that boys had the lowest rates of participation in household production in 1993. This translates into increased participation of boys in any work associated with rice price increases. Moreover, we also observe a decline in participation in work within the household (driven mostly by declines in household production) for adult women ages 25-64 with rice price increases. As a result, rice price increases are associated with declines in participation in any work for adult women. However, the magnitude of the effect is small because the reduction in participation in household production is mitigated by an increase in participation in wage work (albeit this increase is not statistically significant). However, adults do experience statistically significant increases in wage work in nonagricultural activities with rice price increases. Overall, rice price changes are in general not associated with statistically different labor supply responses for males and females.

5.2 Hours

[19] The above results do not condition the sample on people that participate in any work. In unreported regressions, we have also repeated the analysis in table 5 using only individuals that participate in any work. The conclusions did not change. Similarly, we have repeated the analysis only on the sample of individuals that participate in market work, which abstracts from participation in household production. Again, this yielded similar findings (with the exception that higher rice prices were associated with increased participation of children in household agriculture).

The previous subsection found little association between product price variation and participation in most work categories. However, it is possible that the bluntness of participation measures misses important variation in hours worked. In this section, we examine the association between rice price movements and changes in hours worked.

We consider hours worked overall and in wage work, within the household, market work within the household, household production, and market work. In addition, we also consider hours worked by sector in agriculture (wage work, within the household, overall), and in nonagricultural activities (wage work, within the household, overall). Unfortunately, hours worked in agriculture, agriculture within the household, market work within the household, market work, and total hours may be affected by the changes in the questions collecting information on household agriculture (discussed in detail in section 3). Thus, while we present and discuss results for these variables, we are concerned about biases introduced into our discussion because of the changes in the questionnaire. The inclusion of the year indicator in (1) might ameliorate this question design problem, if the error introduced by the question change affects all households similarly in expectation or, more generally if the change in how respondents respond to hours worked questions does not vary with rice prices conditional on the year effect (and other covariates). We know of no way to check these conditions. Thus, we interpret the data on hours worked in agriculture, agriculture within the household, market work within the household, market work, and total hours with hesitation. However, note that variables such as wage work, household production, hours worked in nonagricultural activities (wage work, household enterprise, overall), and wage work in agriculture are not affected.

In examining the link between rice prices and hours worked, we maintain the regression strategy based on equation (1). Namely, we regress hours worked by type of work against rice

prices, rice prices * male, and all of the controls described in section 4. We continue to estimate separate regressions by age group. Table 5 presents our basic results using all individuals. Because these results are based on all individuals regardless of their participation in a give activity, the results reflect changes in participation and changes in hours worked. However, in many work categories, we have a large number of individuals who work zero hours. In Table 6, we consider hours worked conditional on working positive hours in the indicated work category. Many authors in the labor supply literature argue that the observations of zero hours worked are actually a censored representation of negative hours worked and estimate (1) with a censored regression model. Table 7 reproduces table 5 regressions using the Tobit model.[20] In general, the signs of the association between rice prices and hours worked is the same across all three tables (wage work for ages 16-24 is an exception). Our discussion thus focuses on table 5.

Several interesting results emerge. First, we observe statistically significant declines in total hours worked with increases in rice prices for all age groups. With the exception of children, these declines are not statistically different across males and females, albeit the magnitude of the decline is smaller for males. The 30 percent rise in rice prices lowers the hours worked by a girl by about 3 hours, which corresponds to a 20 percent reduction in hours worked from her 1993 base. Young females ages 16-24 and women age 25-64 experience a similar decline in hours worked (about 3 hours) with the 30 percent increase in rice prices. For them, 3 hour reduction in hours worked corresponds to about 7 percent reduction in hours worked from their 1993 base. The 30 percent rice in rice prices lowers the hours worked by boys by 1.3 hours (which corresponds to a 12 percent decline in hours worked from their 1993 base), by 2.5 for

[20] Because very few children participate in wage work and household enterprise, we were not able to estimate Tobit regressions for ages 6-15 in wage work, wage work in agriculture, wage work in nonagricultural activities, household enterprise, and nonagricultural activities. Similar caveat applies to wage work in agriculture for ages 16-24.

males ages 16-24 (7 percent decline in hours worked from their 1993 base), and by 1.8 hours for men ages 25-64 (4 percent decline in hours worked from their 1993 base).

Second, these observed declines in total hours worked can mostly be attributed to declines in hours worked within the household rather than declines in hours worked for wages. Column 2 and 3 report hours worked for wages and hours worked within the household, respectively. Rice price increases are associated with no statistically significant changes in hours worked for wages for children and young adults. However, these results are not robust to conditioning on participation in wage work or accounting for censoring.[21] Adults ages 24-65 experience an increase in wage work associated with rice price increases. However, as column 3 indicates, all age groups experience a decline in hours worked within the household. Part of this decline in hours worked within the household can be attributed to fewer hours worked in market work within the household (column 4) and fewer hours devoted to household production (column 5) as rice prices increase. In general, time devoted to market work declines for all age groups with rice price increases (albeit the declines are not statistically significant for ages 16-24).

Third, the right panel of table 5 considers hours worked by sector of employment (agricultural and nonagricultural activities). For each sector, we consider hours worked in wage work, work within the household, and overall. Rice price increases are associated with no changes in wage work in agriculture for children and young adults ages 16-24. However, higher rice prices are associated with increases in wage work in agriculture for adults ages 25-64.

[21] First, because very few children (less than 2.2 percent) work for wages, we cannot estimate this specification with Tobit. Results conditional on participation in wage work suggest that children actually reduce hours worked in wage work (table 6). So, overall, evidence points toward less wage work with higher rice prices. Second, OLS regression that conditions on participation in wage work suggests that adults 16-24 actually increase hours devoted to wage work with rice price increases, while Tobit results suggest that only men experience increases in wage work with rice prices increases. As a result, results for young adults should be interpreted with caution.

Interestingly all groups experience a decline in hours worked in agriculture within the household associated with rice price increases. Overall, these declines in time devoted to agriculture within the household translate into less time devoted to agriculture overall with rice price increases.

Girls experience a small decline in hours spent in wage work in nonagricultural activities with rice price increases, while boys and young adults ages 16-24 do not experience declines in wage work in nonagricultural activities that are statistically significant. As is the case in agriculture, adults devote more time to wage work in nonagricultural activities with rice price increases. Only children experience a decline in hours spent in nonagricultural activities within the household with rice price increases. Overall, with the exception of children who experience a decline in hours in nonagricultural activities with rice price increases, there is not an association between rice price increases and hours worked in nonagricultural activities.

The decline in hours worked in agriculture within the household with rice price increases is an interesting finding. Unfortunately, as discussed in detail in section 3, hours worked in household agriculture is the place where the questionnaire changes are most likely to be substantive. These results should be taken with caution. Nevertheless, if real the decline in hours worked in agriculture associated with rice price increases could be interpreted in several ways. First, the decline in hours worked could reflect a positive income effect when leisure is a normal good. In fact, Edmonds and Pavcnik (2003b) find that income effects play an important role in reducing child labor (and participation in work in agriculture in particular) in Vietnam during the same period. However, note that adults actually increase hours worked in wage work in agriculture (and wage work in general). As a result, decline in hours worked in agriculture within the household is also consistent with increased specialization of households with economic development and could be due to the fact that higher household income associated

with rice price increases enable households to purchase market goods for goods and services previously produced within the household (Edmonds and Pavcnik 2003c). Moreover, the increase in wage work could also be a result of increased employment opportunities in the distribution of rice following international and national rice market integration. The observed increases in hours worked in nonagricultural wage work for adults are consistent with this view. Finally, hours spent in agricultural work within the household could also decline with rice prices if the additional income associated with rice price increases enables households to purchase inputs that substitute for labor in the production of rice even if there is not an overall increase in household specialization.

Finally, gender differences in responses to rice price increases are only statistically significant for children. Table 5 suggests that rice price increases are associated with smaller declines in hours worked for boys in total hours, work within the household, household production, market work, and wage work in nonagricultural activities. This may reflect the fact that girls have higher hours worked and greater participation rates in almost every work category for this age group in 1993 (hours in wage work is an exception).

In sum, the data suggest that rice price changes following the rice market liberalization had a minor effect on participation rates, largely concentrated in children and young adults. Higher rice prices are associated with a decline in participation in work for wages for children ages 6-15 and young adults (ages 16-24). Moreover, we also observe a decline in participation in work within the household and household production for adults (ages 25-64). However, people of all age groups have responded to product price changes by adjusting hours devoted to various activities. For adults, higher product prices are associated with an increase in time devoted to wage work and a decline in household production and market work within the household. The

increase in wage work with higher rice prices occurs in agricultural and nonagricultural activities. Overall, this evidence is consistent with shifting of some adult time out of home production and into the labor market with rice price increases. Young adults also reduce time spent in household production and market work within household, but the evidence on changes in hours spent in wage work is mixed. Children decrease their hours of work in every category of work with rice price increases (albeit the decline in wage work (overall and in agriculture) is not statistically significant). Interestingly, we find that all age categories reduce time devoted to agriculture with rice price increases (mostly due to decreases to time devoted to household agriculture). However, changes in the questionnaire through time cause us to be concerned about how to interpret our results for work in agriculture within the household, total hours worked, hours worked within the household, and market work. Nevertheless, we do find an interesting pattern that people in general are reducing hours devoted to household production with rice price increases, and that adults shift some of their time to wage work. These two variables are not contaminated with the questionnaire change. Finally, with the exception of children, we do not find much evidence of gender differences in the response to rice price increases.

6. Conclusion and Discussion

Future international market integration will likely lead to large changes in prices in the local agricultural markets of poor nations. In this study, we have considered how household labor supply responds to a large (almost 30 percent) increase in the price of rice associated with the liberalization of rice markets in Vietnam.

Our findings suggest that, relative to their activities before the price increases, the largest effect of rice price increases on participation in economic activities is on children and young adults. In particular, there appear to be large decreases in participation in wage work for children

and young adults. The 30 percent increase in rice prices is associated with a reduction in participation in wage work that corresponds to the 55 (20) percent decline for girls (boys) age 6-15 from their 1993 base and 28 (30) percent decline for young women (men) age 16-24 from their 1993 base. Our estimates suggest smaller declines for boys at the same ages, but the data do not reject the hypothesis that boys and girls experience reductions of the same magnitude. The response of adult labor supply to the price increase is relatively minor. The only statistically significant change in participation is a decline in participation in household production for adult women and a small decline in participation of adults (especially women) in any type of work.

However, we find that increases in rice prices are associated with relatively large declines in hours worked that appear similar across all age groups. While part of these differences may be attributable to changes in the questionnaire, the hours worked in household production (which is based on identical questions in both rounds of the data) document a similar pattern. Across age groups, the 30 percent increase in rice prices is associated with 3 fewer hours of work per week. One of these hours less work is in household production. The decline in hours worked in household production for adults is accompanied by a similar increase in time spent in wage work.

Interestingly, with the exception of children, we do not observe statistically significant gender differences in responses to rice price changes. This last finding is in contrast to the evidence in Newman (2002), who observes increases in the time men devote to household production in regions in Ecuador that specialize in production of fresh flowers for export and employ relatively more women. These differences in results might not be that surprising in the Vietnamese context. The absence of significant gender differences in Vietnam probably reflects the fact that Vietnamese men and women seem to have very similar labor market participation in

1993 (with the exception of wage work and household production). By and large, men and women participate in similar types of activities so they react to price and income changes similarly.

Finally, since very few people in countries such as Vietnam actually work for wages outside the household, our study considered the implications of product market integration on wage work (i.e. more formal labor market) as well as work within the household (work in household agriculture, household enterprise, or household production). Our results suggest that it is in fact important to also consider time spent in work within the household since adults tend to reduce time spent in household production when they increase time in wage work. Our findings confirm the conclusions by Smith, Thomas, Frankenberg, Beegle, and Teruel (2002) and Thomas, Beegle, and Frankenberg (2000) on the importance of focusing on economic activities within the households in the policy analysis. These two studies analyze the effect of the 1998 Indonesian crisis on the labor market activities of Indonesian men and women. They find that large increases in female participation in self-employment and family business in rural areas following the crisis have mitigated the negative impacts of the crisis on Indonesian families. Abstracting from employment within the household would ignore an important channel though which the Asian crisis affected the Indonesian families. In the present case, ignoring employment within the household would miss an important part of the household's response to rice price changes associated with market integration.

Our work has several policy implications. First, many opponents of globalization argue that increased integration of poor economies such as Vietnam into the global market will increase child labor in these economies. In fact, trade sanctions by developed countries against exports from developing countries are often viewed as the policy that will eliminate child labor.

However, our work suggests that higher product prices associated with increased access of poor country exports to global markets in our case study lead to less child labor. Our results thus suggest that these export sanctions might not accomplish their desired goal and might actually induce more rather than less child labor. Second, increased product market integration is associated with shifts in household adult labor away from work in household production toward wage work. This is consistent with increased specialization of households with economic development and could be due to the fact that higher household income associated with rice price increases enables households to purchase market goods and services previously produced within the household. Overall, these shifts in resources away from the household toward the market are potentially associated with efficiency gains due to specialization and might provide an additional channel though which product market integration improves welfare.[22] The increase in wage work could also be a result of increased employment opportunities in the distribution of rice following international and national rice market integration.

Overall, our results are in line with a scenario where increased rice prices following product market liberalization provide households with additional income. Households respond to this additional income by reducing the time devoted to work by all household members. In Vietnam, most rural households produce rice. Thus, the effects of international product market integration of a country's primary export are widespread. Of course, the effect of product market integration on the economic activities of household members might be different in a country setting where resources are distributed across households much more unevenly or where many people are employed in the production of an import competing good that observes a decline in its relative price following international market liberalization. However, most people in very poor

[22] Standard trade models focus on gains from trade due to reallocation of resources toward the industry with comparative advantage. Product market integration might be associated with similar process within the household if there are fixed costs to trading outside of the household that expanded markets overcome.

economies that will be affected by agricultural liberalization negotiated in the current WTO round derive their income from agriculture and might thus experience similar changes as Vietnam.

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Figure 1—Commune Rice Prices in 1993 and 1998

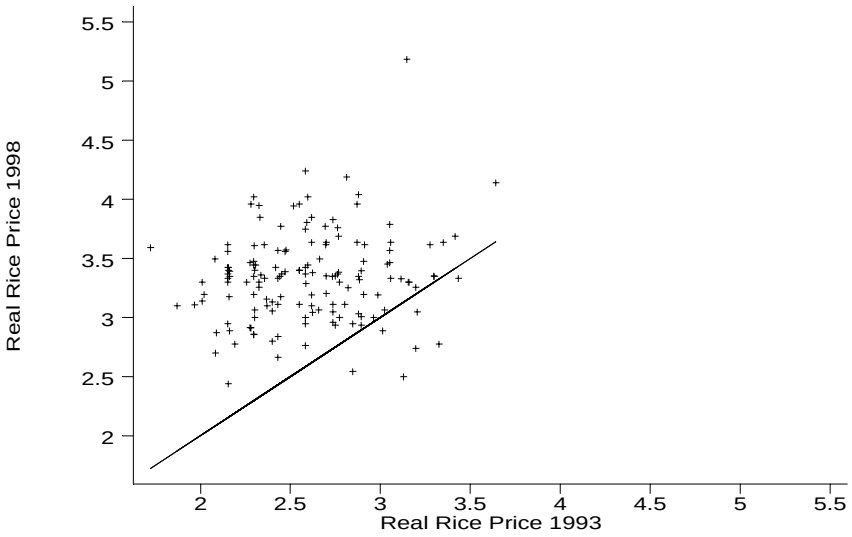

Table 1: Descriptive Statistics

	1993	s.e.	1998	s.e.
Nationally Representative Sample				
Sample Size	4,799		5,999	
Population	12,916,989		16,128,313	
Community Observations	150		194	
In Panel Community*	0.98	0.01	0.83	0.03
Urban	0.23	0.03	0.24	0.03
Rice Price	2.59	0.03	3.31	0.03
Rice Budget Share	0.28	0.01	0.23	0.01
% Producing Rice	0.70	0.03	0.59	0.03
Rural, Panel Communes				
Sample Size	3,635		3,639	
Community Observations	115		115	
Rice Price	2.54	0.03	3.32	0.03
Rice Budget Share	0.31	0.01	0.26	0.01
% Producing Rice	0.85	0.02	0.79	0.02

The full sample means are weighted to be nationally representative. The rural panel commune means are not weighted. Standard errors are corrected for sample design. Because of the increase in sample size overall between 1993 and 1998, four additional rural households were added within panel communes (Basic Information 2000). There is not a panel of 3635 households, because attriters were replaced with randomly selected households from within the same commune (using the original household list). *83 percent of households in the 1998 nationally representative survey are in panel communes.

Table 2: Labor Market Participation by Gender, Age and Year in Rural Areas

	6-15		16-24		25-64	
	1993	1998	1993	1998	1993	1998
Women						
Participation in Last Seven Days (%)						
Wage Work	2.2	1.4	14.1	14.2	8.7	8.6
Agriculture	1.5	0.9	6.7	5.7	4.4	3.0
Non-Agricultural activities	0.7	0.5	7.4	8.4	4.4	5.6
Within Household Work	69.0	64.3	90.2	90.3	96.1	97.4
Agriculture	30.8	24.1	61.8	61.2	69.7	76.8
Household Enterprise	4.9	2.8	16.1	15.0	17.4	20.1
Household Production	62.6	62.7	86.1	87.5	93.8	95.4
Overall (any work)	69.4	64.6	93.3	94.4	96.7	98.0
Market Work	35.8	27.0	80.8	79.9	83.0	89.5
Hours Worked per Week						
Total hours	21.5	16.7	42.1	38.4	45.6	49.6
Wage Work	15.0	17.3	18.4	20.9	18.1	20.4
Agriculture	14.1	14.5	14.7	13.8	15.6	14.3
Nonagricultural activities	18.0	24.7	23.1	27.6	21.5	26.4
Within Household Work	20.9	16.3	39.0	34.4	43.2	46.8
Agriculture	17.5	16.2	25.1	24.7	25.6	32.0
Household Enterprise	17.6	18.5	20.5	25.6	24.0	26.5
Household Production	12.1	9.0	14.9	10.7	17.4	13.5
Market Work	19.1	17.9	29.9	31.4	30.8	38.3
Men						
Participation in Last Seven Days						
Wage Work	1.9	1.1	20.2	21.0	20.7	21.9
Agriculture	1.4	0.7	9.3	7.5	8.9	6.3
Non-Agricultural activities	0.6	0.5	10.9	13.6	11.9	15.7
Within Household Work	60.8	56.6	79.1	76.9	90.7	90.2
Agriculture	29.3	23.6	60.6	53.6	67.4	69.2
Household Enterprise	3.5	2.8	13.2	11.5	18.6	20.8
Household Production	47.7	50.6	54.8	60.6	73.8	73.8
Overall (any work)	61.9	57.2	90.3	87.6	96.1	96.6
Market Work	33.4	26.1	84.0	76.3	88.6	91.9
Hours Worked per Week						
Total hours	18.4	14.9	36.7	33.0	41.6	43.6
Wage Work	18.0	17.0	20.5	23.0	18.8	22.3
Agriculture	17.7	15.8	18.7	16.9	17.8	19.2
Nonagricultural activities	19.1	17.7	21.8	27.0	19.5	23.6
Within Household Work	17.9	14.5	32.3	26.8	36.5	37.3
Agriculture	17.6	14.9	26.1	22.5	26.3	28.4
Household Enterprise	13.8	12.4	18.7	23.8	20.5	24.7
Household Production	9.9	7.7	10.2	7.0	12.3	8.6
Market Work	18.7	15.8	31.7	30.6	33.2	37.8

All means are weighted to reflect sample design. Market work includes work for wages, work in agriculture within the household, and work in household enterprise. Because people can paricipate in more than one activity the subcotegories of various participation variables do not necessarily add up to participation in wage work, within household work, and overall(any) work. Hours worked in each category are conditional on participation in that particular category. As a result, they do not add up to total hours worked (and subcategories of wage work and within household work do not add up to hours worked in wage work and within household work).

Table 3: Empolyment Status for Workers in Rural Households

		Wage work (1)	Work Within the Household (2)	Market Work Within the Household (3)	Household Production (4)	Market Work (5)	Any Work (6)
Ages 6-15							
	Rice Price	-0.04	0.008	-0.08	0.084	-0.115	0.003
		[0.019]**	[0.069]	[0.079]	[0.088]	[0.082]	[0.069]
	Rice Price*Male	0.028	0.116	0.064	0.046	0.097	0.125
		[0.022]	[0.067]*	[0.062]	[0.082]	[0.061]	[0.066]*
	Observations	9586	9586	9586	9540	9586	9586
	R-squared	0.09	0.38	0.36	0.31	0.37	0.39
Ages 16-24							
	Rice Price	-0.146	-0.036	-0.034	-0.121	-0.117	-0.031
		[0.084]*	[0.056]	[0.090]	[0.091]	[0.071]*	[0.046]
	Rice Price*Male	-0.051	0.073	0.144	0.003	0.043	-0.032
		[0.097]	[0.079]	[0.109]	[0.126]	[0.089]	[0.068]
	Observations	6059	6059	6059	6058	6059	6059
	R-squared	0.14	0.11	0.15	0.2	0.13	0.09
Ages 25-64							
	Rice Price	0.052	-0.063	-0.051	-0.086	0.001	-0.036
		[0.040]	[0.026]**	[0.047]	[0.045]*	[0.044]	[0.018]**
	Rice Price*Male	0.022	0.081	0.005	0.041	-0.008	0.031
		[0.061]	[0.043]*	[0.060]	[0.084]	[0.050]	[0.028]
	Observations	13324	13324	13324	13321	13324	13324
	R-squared	0.12	0.05	0.1	0.15	0.1	0.03

Note: * and ** denote significance at 10% and 5% level, respectively. Standard errors that correct for clustering on community/survey time are reported in parenthesis. All regressions include commune fixed effects, third order polynomial in age, a gender effect, number of completed grades, year effect, interaction of year effect with regions, interaction if commune accessibility with year, controls for the season of interview and whether the interview is at a rice harvest or planting time. In addition, all terms of the age polynomial, number of completed grades, year effect, interaction of year effect with regions, interaction of commune accessibility with year, controls for the season of interview and whether the interview is at a rice harvest or planting timeall are interacted with male indicator. Number of observations is smaller in household production because some people that report working outside household production, have missing data on household production.

Table 4: Participation by Sector

		Agriculture			Nonagricultural activities		
		Wage work (1)	Household (2)	All (3)	Wage work (4)	Household (5)	All (6)
Ages 6-15							
	Rice Price	-0.041	-0.032	-0.073	0	-0.029	-0.029
		[0.018]**	[0.075]	[0.077]	[0.008]	[0.033]	[0.034]
	Rice Price*Male	0.027	0.052	0.078	0.001	-0.001	0.006
		[0.019]	[0.058]	[0.058]	[0.012]	[0.040]	[0.040]
	Observations	9586	9586	9586	9586	9586	9586
	R-squared	0.08	0.35	0.36	0.05	0.12	0.13
Ages 16-24							
	Rice Price	-0.155	-0.02	-0.101	0.009	0.077	0.091
		[0.068]**	[0.101]	[0.095]	[0.053]	[0.067]	[0.082]
	Rice Price*Male	0.03	0.087	0.076	-0.082	-0.038	-0.123
		[0.061]	[0.119]	[0.109]	[0.077]	[0.083]	[0.103]
	Observations	6059	6059	6059	6059	6059	6059
	R-squared	0.14	0.22	0.22	0.14	0.14	0.18
Ages 25-64							
	Rice Price	-0.004	-0.047	-0.064	0.052	0.033	0.095
		[0.034]	[0.053]	[0.054]	[0.026]**	[0.053]	[0.058]
	Rice Price*Male	0.016	-0.043	-0.041	0.009	0.028	0.034
		[0.039]	[0.077]	[0.075]	[0.048]	[0.059]	[0.070]
	Observations	13324	13324	13324	13324	13324	13324
	R-squared	0.08	0.16	0.15	0.12	0.12	0.18

Note: See comments to table 3.

Table 5: Hours Worked (OLS, not conditional on working)

								Agriculture			Nonagricultural activities		
		Total Hours	Wage work	Work Within the Household	Market Work Within the Household	Household Production	Market Work	Wage work	Household	All	Wage work	Household	All
		(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
Ages 6-15													
	Rice Price	-9.508	-0.516	-9	-5.376	-3.719	-5.895	-0.15	-4.425	-4.578	-0.366	-0.951	-1.317
		[2.381]**	[0.418]	[2.272]**	[1.479]**	[1.495]**	[1.565]**	[0.383]	[1.417]**	[1.446]**	[0.196]*	[0.573]*	[0.598]**
	Rice Price*Male	5.015	0.674	4.337	2.057	2.306	2.746	0.103	2.171	2.29	0.571	-0.115	0.457
		[1.849]**	[0.463]	[1.838]**	[1.516]	[1.276]*	[1.567]*	[0.419]	[1.475]	[1.539]	[0.290]**	[0.623]	[0.669]
	Observations	9532	9579	9532	9579	9539	9579	9579	9579	9579	9579	9579	9579
	R-squared	0.45	0.08	0.44	0.36	0.23	0.38	0.08	0.37	0.38	0.05	0.1	0.1
Ages 16-24													
	Rice Price	-9.631	3.126	-12.488	-8.758	-3.671	-5.896	0.95	-8.678	-7.751	2.176	-0.08	1.855
		[4.598]**	[2.462]	[4.837]**	[4.112]**	[1.777]**	[3.826]	[1.172]	[4.114]**	[4.131]*	[2.122]	[1.718]	[2.654]
	Rice Price*Male	1.117	-2.315	3.125	1.031	1.98	-0.99	0.297	-0.545	-0.229	-2.612	1.579	-0.75
		[4.214]	[2.735]	[4.754]	[4.090]	[1.919]	[3.874]	[1.294]	[4.131]	[4.073]	[2.415]	[2.293]	[2.903]
	Observations	6040	6043	6040	6042	6056	6042	6043	6042	6042	6043	6043	6043
	R-squared	0.29	0.18	0.31	0.28	0.28	0.27	0.16	0.35	0.34	0.17	0.13	0.22
Ages 25-64													
	Rice Price	-9.19	3.566	-12.706	-9.551	-3.175	-6.032	1.596	-8.942	-7.347	1.97	-0.609	1.315
		[4.128]**	[1.094]**	[4.078]**	[3.296]**	[1.682]*	[3.339]*	[0.873]*	[3.332]**	[3.429]**	[0.769]**	[1.228]	[1.345]
	Rice Price*Male	3.156	0.425	2.759	0.786	1.989	1.178	0.15	0.576	0.723	0.275	0.211	0.454
		[3.283]	[1.744]	[3.414]	[2.849]	[1.924]	[2.842]	[1.025]	[2.988]	[3.323]	[1.417]	[1.744]	[1.962]
	Observations	13301	13305	13301	13305	13319	13305	13305	13305	13305	13305	13305	13305
	R-squared	0.27	0.13	0.26	0.24	0.24	0.27	0.1	0.32	0.29	0.13	0.11	0.19

Note: See comments to table 3. Number of observations varies because some categories of work have missing observation.s

Table 6: Hours Worked (OLS conditional on working)

								Agriculture			Nonagricultural activities		
		Total Hours (1)	Wage work (2)	Work Within the Household (3)	Market Work Within the Household (4)	Household Production (5)	Market Work (6)	Wage work (1)	Household (2)	All (3)	Wage work (4)	Household (5)	All (6)
Ages 6-15													
	Rice Price	-11.574	-50.153	-10.857	-11.345	-6.155	-9.959	-44.763	-9.493	-7.576	0	-11.48	-29.44
		[3.246]**	[23.613]**	[3.142]**	[3.532]**	[2.272]**	[3.727]**	[31.040]	[3.545]**	[3.686]**	[0.000]	[15.531]	[15.889]*
	Rice Price*Male	3.88	-19.373	2.989	0.205	2.245	0.582	-19.706	-1.022	-1.628	0	3.269	12.07
		[2.571]	[28.100]	[2.559]	[3.303]	[1.929]	[3.343]	[41.433]	[3.316]	[3.461]	[0.000]	[16.250]	[10.738]
	Observations	6078	221	6040	3110	5264	3196	170	2954	3017	54	291	346
	R-squared	0.39	0.66	0.38	0.38	0.22	0.37	0.73	0.4	0.39	0.91	0.65	0.62
Ages 16-24													
	Rice Price	-10.548	20.519	-14.659	-11.31	-3.104	-5.547	18.194	-11.442	-7.729	3.777	-2.012	2.762
		[4.659]**	[7.869]**	[4.914]**	[4.333]**	[2.116]	[3.888]	[11.220]	[4.520]**	[4.512]*	[12.901]	[10.273]	[7.784]
	Rice Price*Male	0.916	-10.651	2.568	-1.111	1.583	-2.967	4.067	-2.773	-3.588	-14.527	12.265	-5.94
		[3.971]	[8.092]	[4.456]	[3.426]	[2.063]	[3.418]	[8.869]	[3.517]	[3.590]	[14.341]	[13.535]	[7.295]
	Observations	5771	1551	5550	5023	4373	5446	786	4780	4961	782	797	1574
	R-squared	0.29	0.29	0.31	0.29	0.31	0.27	0.36	0.35	0.32	0.38	0.36	0.29
Ages 25-64													
	Rice Price	-8.799	8.858	-12.11	-8.483	-2.371	-5.434	15.374	-9.421	-7.379	-1.117	-1.64	-0.463
		[4.173]**	[4.781]*	[4.064]**	[3.483]**	[1.679]	[3.533]	[7.000]**	[3.654]**	[3.671]**	[7.581]	[5.653]	[4.270]
	Rice Price*Male	2.62	-3.913	1.311	-0.793	0.783	1.041	-0.375	0.116	0.062	1.975	-3.167	-1.856
		[3.153]	[5.502]	[3.282]	[2.590]	[1.591]	[2.470]	[8.679]	[2.716]	[2.850]	[8.110]	[5.526]	[4.405]
	Observations	13141	3048	12958	12111	11286	12654	1428	11394	11656	1640	2518	4089
	R-squared	0.28	0.22	0.27	0.25	0.24	0.27	0.33	0.32	0.29	0.28	0.24	0.23

Note: See comments to table 3 and 5.

Table 7: Hours Worked Tobit Results

								Agriculture			Nonagricultural activities		
		Total Hours (1)	Wage work (2)	Work Within the Household (3)	Market Work Within the Household (4)	Household Production (5)	Market Work (6)	Wage work (1)	Household (2)	All (3)	Wage work (4)	Household (5)	All (6)
Ages 6-15													
	Rice Price	-10.014	na	-9.517	-8.214	-3.151	-9.417	na	-6.353	-6.947	na	na	na
		[2.594]**		[2.553]**	[3.938]**	[1.775]*	[3.998]**		[3.843]*	[3.896]*			
	Rice Price*Male	7.403		6.566	5.712	2.852	7.549		6.545	7.109			
		[2.715]**		[2.674]**	[4.073]	[1.876]	[4.128]*		[3.977]*	[4.027]*			
	Observations	9532		9532	9579	9539	9579		9579	9579			
Ages 16-24													
	Rice Price	-9.716	-14.579	-13.173	-9.915	-4.63	-6.843	na	-9.912	-9.708	-8.715	8.191	-0.676
		[3.797]**	[9.183]	[4.077]**	[3.937]**	[1.972]**	[3.660]*		[3.721]**	[3.735]**	[15.589]	[13.911]	[9.453]
	Rice Price*Male	0.878	19.882	3.118	1.406	1.631	-0.662		-0.661	0.346	9.433	1.267	5.118
		[3.934]	[9.466]**	[4.228]	[4.083]	[2.080]	[3.792]		[3.861]	[3.867]	[16.151]	[15.000]	[9.978]
	Observations	6040	6043	6040	6042	6056	6042		6042	6042	6043	6043	6043
Ages 25-64													
	Rice Price	-9.303	7.093	-13.034	-10.13	-3.621	-6.308	0.66	-9.157	-7.688	19.846	-7.197	0.86
		[2.262]**	[6.281]	[2.513]**	[2.410]**	[1.264]**	[2.148]**	[8.239]	[2.314]**	[2.338]**	[10.146]*	[8.086]	[5.821]
	Rice Price*Male	3.315	9.288	3.169	1.323	1.877	1.439	16.621	0.895	1.118	-9.135	1.332	1.689
		[2.467]	[6.497]	[2.742]	[2.631]	[1.394]	[2.343]	[8.721]*	[2.529]	[2.553]	[10.165]	[8.808]	[6.157]
	Observations	13301	13305	13301	13305	13319	13305	13305	13305	13305	13305	13305	13305

Note: See comments to table 3 and 5. Cells labeled by na represent cases in which too few observations report positive hours worked to estimate the regression with Tobit (i.e. no convergence is achieved).